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EXAMINER	
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ART UNIT	PAPER NUMBER
2131	

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11

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

09/814,607

Applicant(s)

MURAKAMI ET AL.

Examiner

Aravind K Moorthy

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 18 November 2002.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-3, 5-29, 31, 32 and 35 is/are pending in the application.
- 4a) Of the above claim(s) 4, 30, 33 and 34 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7, 9-16, 18-22, 24-26, 28 and 30-35 is/are rejected.
- 7) ☒ Claim(s) 8, 17, 23, 27 and 29 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 November 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.  
If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

### Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).  
a) ☐ All b) ☐ Some \* c) ☐ None of:  
1. ☐ Certified copies of the priority documents have been received.  
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.  
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).  
\* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).  
a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). \_\_\_\_\_
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_\_ 6) ☐ Other:

## **DETAILED ACTION**

### ***Response to Arguments***

**Applicant's arguments filed 12/17/02 have been fully considered but they are not persuasive.**

### ***Specification***

1. The applicant overcomes objections to the specification by providing the serial number to which the pending application claims priority to and by providing the references numbers for the drawings.

### ***Drawings***

2. The informal drawings submitted by the applicant are accepted since no new matter is presented.

### ***Claim Rejections - 35 USC § 112***

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3, As to the examiner's first 35 USC 112, first paragraph, rejection with respect to claims 1-35 the examiner maintains the rejection.

Page 11 lines 2-6, do not specify how "the position on the upslope of the heartbeat waveform having the fastest rate of change slope" provide unique characteristics for an individual. On page 11 lines 9-15, the examiner asserts that the applicant has provided features of the heartbeat waveform, but does not disclose how these features are unique to an individual.

The applicant argues that the specification discloses examples of substantially unique biological traits that may be analyzed to authenticate an individual. The examiner respectfully disagrees that applicant does not provide details on how the particular biometric features of the use of authentication by heartbeat and other live biological traits are unique to a particular group of people or to an individual. Without such details, one skilled in the art would be required to engage in undue experimentation in order to practice or use the invention. A person of ordinary skill in the art would have to undergo clinical trials to measure and come up with a criterion to differentiate between different individuals.

The applicant argues that on page 12, discloses how bone density is used in authentication. On page 12, the applicant discloses, "the density of a particular kind of connective tissue, such as bone density, may be another substantially unique histological trait". The examiner respectfully disagrees. The examiner asserts that the applicant merely list examples of potentially substantially unique biological traits. The examiner asserts that the applicant does not provide what characteristics of the bone density are unique to an individual. The applicant argues that the examiner made a "best mode" rejection. The examiner made an enablement rejection because the applicant did not address how characteristics such as power, heat quantity, heat flux, volumetric heat release, and electrical capacities could serve as measurements of biometric traits. The applicant did not address the many factors that affect a person's heartbeat such as stress/emotion level, amount of physical activity, time of day (heartbeat slowest in the morning), and health of individual. Also multiple individuals with the same pacemaker will all have the same heart rate. These factors make it difficult to differentiate a heartbeat between multiple individuals for authentication.

***Second Paragraph:***

4. As to claims 20, 33 and 34, the applicant as overcome rejection under USC 112, second paragraph by removing the phrase “such as”.

***Claim Rejections - 35 USC § 101***

35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

5. Claims 20-27 stand rejected under 35 USC 101. Claim 20 is directed to a computer software program comprising instructions. The examiner asserts that programs do not fall with any of the statutory classes listed in 35 U.S.C 101. A program is in and of itself non-statutory subject matter that does not fall within the realm of 35 USC 101. Actually a program is more akin to non-functional data, as software cannot without aid of a device such as a computer perform any of the recited functions.

***Claim Rejections - 35 USC § 102***

6. As to claims 1, 2, 8, 16, 20-21, 26-28 and 30-31, the applicant argues that Osten does not teach each and every element of the claimed invention, as amended, and thus do not anticipate the claimed invention. The examiner agrees that Osten does not teach each and every element of the claimed invention, as amended. Osten does not teach the limitation of “reading a first unique hemodynamic waveform of an individual and analyzing said waveform to identify unique traits”.

***Claim Rejections - 35 USC § 103***

7. As to claims 1, 9, 16, 20, 28 and 35, the examiner agrees with that applicant that Osten does not teach a method by which a waveform may be read and analyzed to identify certain unique traits. The examiner agrees with the applicant that Osten fails to suggest reading an

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analyzing a hemodynamic waveform to identify unique traits for authentication as claimed by the present application. The examiner agrees that each of the Steuer, Schiller, Merriam-Webster, Rice and Brady references also fail to disclose reading and analyzing a hemodynamic waveform to identify unique traits for authentication.

### *Claim Objections*

8. Claims 8, 17, 23 and 27 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Piosenka-Osten-Vanoni combination does not teach that the retinal scan comprises light absorption characteristics of the skin tissue of the individual.

Claim 29 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. The Piosenka-Osten-Vanoni combination does not teach that retinal scanning comprises the depth of a previously identified layer of epithelial tissue.

### *Claim Rejections - 35 USC § 112*

The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

9. **Claims 2, 3, 5-8, 17, 21, 22, 27, 29, 31 and 32 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.**

Claim 2 recites the limitation "said first live internal biological trait" in the claim. There is insufficient antecedent basis for this limitation in the claim. Claim 2 depends on claim 1. Claim 1 recites the limitation "a first unique, hemodynamic waveform". For the sake of

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examining the examiner assumes that the limitation in claim 2 is "said first unique, hemodynamic waveform".

Claim 5 recites the limitation "the method of claim 4" in the claim. There is insufficient antecedent basis for this limitation in the claim. Claim 4 is a cancelled claim so therefore claim 5 cannot depend on claim 4. For the sake of examining, the examiner assumes that claim 5 depends on claim 1.

Claim 8 recites the limitation "said second biological trait" in the claim. There is insufficient antecedent basis for this limitation in the claim. Claim 8 depends on claim 1. Claim 1 recites the limitation "a second unique, internal physiological trait". For the sake of examining the examiner assumes that the limitation in claim 8 is "said second unique, internal physiological trait".

Claim 17 recites the limitation "said second biological identifier" in the claim. There is insufficient antecedent basis for this limitation in the claim. Claim 17 depends on claim 16. Claim 16 recites the limitation "a second unique, internal physiological identifier". For the sake of examining the examiner assumes that the limitation in claim 17 is "said second unique, internal physiological identifier".

Claims 21 and 22 recite the limitation "said first live internal biological trait" in the claim. There is insufficient antecedent basis for this limitation in the claim. Claims 21 and 22 depend on claim 20. Claim 20 recites the limitation "a first unique, physiological hemodynamic waveform". For the sake of examining the examiner assumes that the limitation in claims 21 and 22 are "said first unique, physiological hemodynamic waveform".

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Claim 27 recites the limitation "said second biological trait" in the claim. There is insufficient antecedent basis for this limitation in the claim. Claim 27 depends on claim 20. Claim 20 recites the limitation "a second unique, internal physiological trait". For the sake of examining the examiner assumes that the limitation in claim 27 is "said second unique, internal physiological trait".

Claims 29 and 31 recite the limitation "said second live internal biological identifier" in the claim. There is insufficient antecedent basis for this limitation in the claim. Claims 29 and 31 depend on claim 28. Claim 28 recites the limitation "a second internal physiological identifier". For the sake of examining the examiner assumes that the limitation in claims 29 and 31 are "said second internal physiological identifier".

Claim 32 recites the limitation "said method" in the claim. There is insufficient antecedent basis for this limitation in the claim. Claim 32 depends on claim 28. Claim 28 is a systems claim. For the sake of examining, the examiner assumes that the limitation in claim 32 is "said system".

Any claims not directly addressed are rejected on the virtue of their dependency.

**10. Claims 9, 10, 12-15 stand rejected over prior art as stated in previous office action.**

***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.



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**11. Claims 1, 16, 18-20, 28, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Piosenka et al U.S. Patent No. 4,993,068 in view of Osten et al U.S. Patent No. 5,719,950 and Vanoni EP 197810.**

As to claims 1, 16, 20, and 28, Piosenka discloses reading a second unique, internal physiological trait [retinal scan] of the individual. Piosenka discloses authenticating the identity of the individual if all the credentials of the individual correspond with previously enrolled traits recorded for the individual.

Piosenka does not teach reading a first unique, hemodynamic waveform of an individual. Piosenka does not teach analyzing the waveform to identify unique traits.

Vanoni teaches reading a Doppler signal waveform from blood flowing in a human artery. Vanoni teaches a CPU comparing with characteristics signals from authorized persons [abstract].

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Piosenka by the teaching of Vanoni to have the reading of the Doppler waveform, of Vanoni, to replace the reading of fingerprints of Piosenka. The Doppler waveform would have been the first unique, hemodynamic waveform of the individual. The identity of the individual would have been authenticated if all three credentials (picture, retinal scan, and Doppler waveform) corresponded with previously enrolled traits.

The motivation to modify Piosenka by the teaching of Vanoni would provide a form of authentication that is as characteristic of the individual as is a fingerprint. The problems of fingerprint analysis are well known in the art. A fingerprint analysis that does not recognize whether the finger is attached to a living human being can be circumvented by electronic or

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photographic reconstructions of the fingerprint or the dismemberment of the finger, see column 2 lines 7-12 of Osten.

As to claim 18, the Piosenka-Osten-Vanoni combination teaches that the authentication is performed by a single computer chip, element 37 of figure 2 of Piosenka.

As to claim 19, it would be obvious to weigh some quantitative features of biological features more than other features of biological identifiers. As stated in previous action there are many factors that affect a person's heartbeat. So if an accurate reading of the heartbeat can be taken then the iris scan would be considered more.

As to claim 31, the Piosenka-Osten-Vanoni combination teaches that the second live internal biological identifier comprises the retinal pattern of an iris, as discussed above.

As to claim 32, the Piosenka-Osten-Vanoni combination teaches that the authentication is performed by a single computer chip, element 37 of figure 2 of Piosenka.

**12. Claims 2, 5, 6, 7, 21, 24, 25, 26 and 35 are rejected under 35 U.S.C. 103(a) as being unpatentable over Piosenka et al U.S. Patent No. 4,993,068, Osten et al U.S. Patent No. 5,719,950 and Vanoni EP 197810 as applied to claim 1 above, and further in view of examiner's official notice.**

As to claims 2 and 21, the Piosenka-Osten-Vanoni combination does not teach that the first unique, hemodynamic waveform is a heartbeat.

The Piosenka-Osten-Vanoni combination teaches that the Doppler waveform is from blood flowing in a human artery.

The examiner takes official notice that blood flows through the arteries of the heart and the blood flow causes the heartbeat.

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It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have analyzed the first unique hemodynamic waveform from the heart.

The motivation to use the heartbeat from the heart is because aorta artery is the largest artery in the human body and goes through the heart. The aorta artery would produce the best signal to analyze for authentication.

As to claims 5 and 24, the Piosenka-Osten-Vanoni combination does not teach that a portable computer performs the step of authentication. The Piosenka-Osten-Vanoni combination teaches that a computer does the authentication.

The examiner takes official notice of portable computers.

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have made the computer of the Piosenka-Osten-Vanoni combination to be a portable computer.

The motivation to use a portable computer is that it would have been easier to move around and do authentication at remote sites. Portable computers also take up less room.

As to claims 6 and 25, it would be obvious to weigh some quantitative features of biological features more than other features of biological identifiers. As stated in previous action there are many factors that affect a person's heartbeat. So if an accurate reading of the heartbeat can be taken then the iris scan would be considered more.

As to claims 7 and 26, the Piosenka-Osten-Vanoni combination verifies physiological activity [retinal scan] as discussed above.

As to claim 35, this rejection can be done in light of the rejections done on claims 1,3 and 5-7.

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**13. Claims 3 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Piosenka et al U.S. Patent No. 4,993,068, Osten et al U.S. Patent No. 5,719,950 and Vanoni EP 197810 as applied to claim 1 above, and further in view of Orr U.S. Patent No. 4,163,447.**

As to claims 3 and 22, the Piosenka-Osten-Vanoni combination does not teach that the first unique, hemodynamic waveform of the individual is measured by reflecting light off of the sub dermal layers of skin tissue on the individual.

Orr teaches that a heartbeat rate monitor comprising a light source for transilluminating skin tissue, a semiconductor detector for detecting variations in the light reflected from the skin tissue so as to produce a signal responsive to and dependent on changes in blood flow, an indicator for giving an indication of the heartbeat rate in dependence on said signal, and a rechargeable electric power source for powering said light source and said indicator, said detector means being capable, on exposure to ambient light, of supplying a current to recharge said source [column 1 lines 40-51].

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the teaching of the Piosenka-Osten-Vanoni combination to measure the hemodynamic waveform by reflecting light off of the sub dermal layers of the skin tissue of the individual.

The motivation to modify the Piosenka-Osten-Vanoni combination is because human skin is a reasonably good transmitter of visible and near infrared light and, within the outer layers at least, no changes in transmission or absorption are observed over the short time periods under consideration [column 2 lines 37-50].

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**14. Claim 11 is rejected under 35 U.S.C. 103(a) as being unpatentable over Piosenka et al U.S. Patent No. 4,993,068, Osten et al U.S. Patent No. 5,719,950 and Vanoni EP 197810 as applied to claim 1 above, and further in view of Orr U.S. Patent No. 4,163,447.**

As to claims 11, Piosenka discloses reading a second unique, internal physiological trait [retinal scan] of the individual. Piosenka discloses authenticating the identity of the individual if all the credentials of the individual correspond with previously enrolled traits recorded for the individual.

Piosenka does not teach reading a first unique, hemodynamic waveform of an individual. Piosenka does not teach analyzing the waveform to identify unique traits. Piosenka does not teach measuring a heartbeat waveform by reflecting light off of the sub dermal layers of skin tissue of the individual.

Vanoni teaches reading a Doppler signal waveform from blood flowing in a human artery. Vanoni teaches a CPU comparing with characteristics signals from authorized persons [abstract].

Orr teaches that a heartbeat rate monitor comprising a light source for transilluminating skin tissue, a semiconductor detector for detecting variations in the light reflected from the skin tissue so as to produce a signal responsive to and dependent on changes in blood flow, an indicator for giving an indication of the heartbeat rate in dependence on said signal, and a rechargeable electric power source for powering said light source and said indicator, said detector means being capable, on exposure to ambient light, of supplying a current to recharge said source [column 1 lines 40-51].

It would have been obvious to a person having ordinary skill in the art at the time the invention was made to modify Piosenka by the teaching of Vanoni to have the reading of the Doppler waveform, of Vanoni, to replace the reading of fingerprints of Piosenka. The Doppler waveform would have been the first unique, hemodynamic waveform of the individual. The identity of the individual would have been authenticated if all three credentials (picture, retinal scan, and Doppler waveform) corresponded with previously enrolled traits. It would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the teaching of the Piosenka by Orr to measure the hemodynamic waveform by reflecting light off of the sub dermal layers of the skin tissue of the individual.

The motivation to modify Piosenka by the teaching of Vanoni would provide a form of authentication that is as characteristic of the individual as is a fingerprint. The problems of fingerprint analysis are well known in the art. A fingerprint analysis that does not recognize whether the finger is attached to a living human being can be circumvented by electronic or photographic reconstructions of the fingerprint or the dismemberment of the finger, see column 2 lines 7-12 of Osten. The motivation to reflect light off the skin is because human skin is a reasonably good transmitter of visible and near infrared light and, within the outer layers at least, no changes in transmission or absorption are observed over the short time periods under consideration [column 2 lines 37-50 of Orr].

### *Conclusion*

15. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

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A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Aravind K Moorthy whose telephone number is 703-305-1373. The examiner can normally be reached on Monday-Friday, 8:00-5:30.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gail O Hayes can be reached on 703-305-9711. The fax phone numbers for the organization where this application or proceeding is assigned are 703-746-7239 for regular communications and 703-746-7238 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-305-1373.

March 20, 2003

  
GAIL HAYES  
SUPERVISORY PATENT EXAMINER  
TECHNOLOGY CENTER 2100